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INFORMATION AS AN OPERATIONAL FACTOR

by

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A paper submitted to the Faculty of the Naval War College in partial
satisfaction of the requirements of the Department of Joint Military Operations.

The contents of this paper reflect my own personal views and are not
necessarily endorsed by the Naval War College or the Department of the Navy.

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15. Abstract: The student of Operational Art would say that to achieve the freedom to act the operational commander must properly balance time, space and forces - the classic operational factors. But these factors alone do not adequately address all the issues in achieving strategic and operational objectives. This paper will not challenge the validity of time, space and forces as operational factors but will focus on the examination of information as a separate operational factor.
    Through identification of major key elements of the operational factor, information: information infrastructure, information warfare, intelligence, the media and adversary knowledge, analysis will be presented on how these elements influence a commander's freedom to act. Evolving doctrine, classic writings and historic examples will be cited to support exploration of the central thesis. Additionally, a short analogy will be utilized to relate operational factor requirements of a surgeon to that of an operational commander.
    The conclusion reached in this paper is that information is indeed an operational factor. With the complete assimilation of data provided by the operational factor, information, the commander will be empowered by a clear perception of the situation and will possess the essential knowledge to support appropriate and timely application of the proper mix and quantity of force. On the other hand, failing to appreciate information as an operational factor may lead the commander to a fallacious belief that overwhelming conventional means are required to subdue an adversary resulting in a potentially tragic asymmetric application of force. This failing may result in inordinately protracted conflicts and a potential for unnecessary risk and loss of life; two conditions which the American people will not accept.

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Abstract of

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INTRODUCTION

For knowledge, too, is itself power.
- Francis Bacon, *Meditationes Sacrae*

Time, space and forces - these are the three classic operational factors. The idea that information should be included amongst these classic operational factors is briefly discussed in NWC 4092, Operational Factors but dismissed indicating that information is properly identified as an operational function and an integral part of intelligence.[1] This exclusion is made even in light of the ever-increasing role information plays in a commander's decision on when, where and more importantly, how military force will be applied in Information Age conflicts.

Faced with rapidly advancing technology and an increasing potential for unconventional conflicts, the United States finds itself in a precarious position. As the world's sole superpower, the U.S. military is clutching to industrial age, threat based strategies and weaponry while facing a new millennium where information age capabilities and Military Operations Other Than War may make much of our current weaponry and strategies obsolete. In preparing for future information age conflicts, the breaking of industrial age paradigms will not be easy nor will an agreement on what needs to be done be readily reached. There are those that indicate the "Revolution in Military Affairs" and the reliance on technological superiority is foolhardy, will result in information overload and will surely lead to disastrous results. Others would like us to believe that the next major conflict will be an "Information War" that will be won or lost with bytes not bullets.

This paper will not argue that technological advances or the increased availability of information is what justifies the existence of information as an operational factor. Nor will this paper question the validity of the original three factors or that information is integral to accumulating data to support the three. Rather, this paper will explore the elements of information, relate those elements to doctrine and historical examples and provide rationale for placing information on an equal footing with space, time and forces in obtaining and maintaining freedom of action. In a sentence, this paper will seek to support the conclusion that information is an operational factor.

BACKGROUND

> . . . any doctrine which attempts to reduce warfare to ratios of forces, weapons and equipment neglects the impact of the human will on the conduct of war and is therefore inherently false.
> - United States Marine Corps. Warfighting. FMFM-1

A factor is defined as "something (as an element, circumstance, or influence) that contributes to the production of a result."[2] In terms of operational factors, the "result" is the freedom of action obtained and maintained when the commander properly balances the classic operational factors of time, space and forces.[3]

Strategic and operational objectives may be achieved by either denying an adversary's freedom to act, maintaining one's own ability to act or a combination of the two. Thus, securing one's freedom to act or the denial of an adversary's freedom of action will lead to seizing initiative, intelligent application of available

resources and effective timing of events which ultimately will lead to the attainment of operational or strategic objectives.[4]

Joint Vision 2010, as the Joint Chiefs' of Staff conceptual template for achieving new levels of effectiveness in joint warfighting has a prominent common thread of information superiority, which will support the military's new conceptual framework for operations in the 21st century.[5] A number of other doctrinal publications from the Joint Staff and the four military services strike similar themes by emphasizing the importance of information superiority. This recognition of the impact which information will have on future warfare is best summed up in the Department of the Army's FM 100-5: "what is most important, however, is the fact that in any operation the Army must have the ability to gain information and influence operations throughout the depth of the battlefield."[6]

A SHORT ANALOGY

To put the idea of information better in focus, a short analogy will be utilized. A successful surgeon, much like a successful military commander understands the proper balancing of time, space and forces. The surgeon certainly understands the period required or consumed in performing surgical procedures. The complete understanding of the surgery to be performed involves time to decide what needs to be done; time to plan and prepare for the surgery to include discussions with colleagues, gathering the surgical team, building a cohesive surgical unit, conducting the surgery, reacting to emergencies and then post-op procedures. These elements would comprise the operational factor of time.   The surgeon

(and the surgical team) must also fully understand the restrictions levied by their physical surroundings as well as the constraints/ restraints on their movements during delicate surgical procedures. The physical attributes of the surgeon's surroundings equate to the operational factor of space.

Finally, related to the operational factor of forces, the surgical team must be constituted of the proper mix and type of well educated, trained professionals. And should the situation dictate, a surgical team must not only have backups available, but a plan for relief during long, tedious operations.

So what is missing from the surgeon's "toolbox" to increase the likelihood that a successful surgical procedure is accomplished? The surgeon and to varying degrees, the members of the surgical team must possess the information or knowledge associated with conducting the surgery. The surgeon, to be successful, must have a clear perception of what is to be accomplished, the likely problems which may occur during the procedure, and a practical understanding of surgery gained from experience. As such, the surgeon must be a student of the medical/surgical arts with a working comprehension of the failures and successes of past surgeons/surgical procedures. The surgeon must also fully understand the adversary. If operating on a cancerous growth, for example, the surgeon must understand more than just how to remove what can be seen. The successful surgeon also requires an in-depth understanding of the tactics employed by cancer as it spreads, survives, hides, and counters the surgeon's attempts to eradicate it. Through proper balancing of all factors, the surgery should be successful.

THE OPERATIONAL FACTOR - INFORMATION

C⁴ISR personnel, organizations, and processes -- traditionally regarded as combat support -- must now be defined as integral to combat.[7]

For the purpose of this paper, the operational factor, information is interpreted to comprise all the data on an adversary and one's own forces that when properly assimilated provides a practical understanding and clear perception of strategic, operational and tactical realities that form the basis for all warfighting knowledge. To properly differentiate the operational factor, information from that data associated with time, space and forces, information is mostly concerned with the preponderance of intangible elements that focus on the appreciation for an adversary's abilities (as well as the abilities of one's own forces). The operational factor, information is comprised of five elements: Information Infrastructure, Information Warfare, Intelligence, The Media, and Adversary Knowledge. Appendix A provides graphic representation of the operational factor, information and it's elements. Analysis of the five elements of the operational factor, information is presented below.

Information Infrastructure

> *. . . providing for the Warrior, at any time and any place, a fused real-time, true representation of the Warrior's battlespace.*
>
> - <u>C⁴I for the Warrior</u>

The Information Infrastructure, or Infosphere,[8] deals with the mechanics of transferring decisionable information[9] from "Sensor to Shooter." Issues addressed are: infrastructure maturity, reliance upon commercial means and whether it is

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military/state controlled. Additionally, an assessment must be made regarding the relative ability to relay command and control (C^2) with respect to accuracy, speed, capacity, survivability, security, and methods used.

To effectively counter an adversary's ability to coordinate the movements of forces over the battlespace, the commander must fully understand the complexity of the infosphere. Through this understanding will come situational awareness and appropriate actions in how to control the flow of information to the shooter from the sensor and if necessary how and where to interdict or influence the battlespace information. During Desert Storm, attacking Iraqi C^2 nodes and systems required a thorough understanding of how these systems were operated, what they provided and what the impact interdiction of varying degrees would have on the C^2 of Iraqi troops and the Iraqi public. When the infosphere is properly organized, the support to friendly forces can be dramatic:

> Information systems lashing together the widely dispersed allied combat forces in Iraq created a paralyzing asymmetry in knowledge. This knowledge substantially reduced uncertainty on one side, visibly diminished the fog of war, magnified the effectiveness of fire power, pinned a huge Iraqi military machine in place and arguably forged a new paradigm for land warfare.[10]

Grenada (Operation Urgent Fury), the aborted Iranian Hostage rescue at Desert One (Operation Eagle Claw), and peace operations in Somalia are three examples where failure to appreciate the complexity of the infosphere was detrimental to a commander's freedom to act. Though communication shortages and interoperability were viewed with concern prior to Grenada, they were not constructively dealt with and if not for an innovative phone-card wielding soldier

and overwhelming numerical superiority, the restricted ability to coordinate and disseminate information could have spelled disaster.[11] On the other hand, the command and control "bureaucratic nightmare" at Desert One could not be overcome and the difficulties encountered resulted in disaster.[12] Somalia offers an example of the detrimental impact on operations of an immature infrastructure.

The Civil War represents the first time a systematic application of formalized military communications systems were extensively utilized by the military commander.[13] Lieutenant General U.S. Grant demonstrated in 1864 the ability to exert command and control over far-flung armies with frequent orders transmitted to his field commanders via telegraph. The freedom of action which resulted broke three years of stalemate and lead to victory in a relatively short time. After the Civil War, the importance of military information was well founded and the gathering and relay of military information evolved with the telegraph, balloons, signal towers, pigeons, dogs, the wireless, satellite communications and computers. As a result, the innovator who introduced new information technology often wielded a decisive advantage until the adversary introduced methods to interdict, disrupt, intercept or destroy the new technology.

A detailed understanding of the battlespace infosphere will support the commander's decisions on the direct or indirect attack upon an adversary's center of gravity. Complete knowledge of the information infrastructure supports a commander's operational scheme or broad vision to facilitate effective movement

of forces and the efficient application of sufficient force to support overwhelming an adversary.

Information Warfare

> *. . . one of the greatest Information Warfare (IW) threats to U.S. military forces is <u>ourselves</u>.*[14]

Joint Vision 2010 calls for "Information Superiority" to support the emerging operational concepts of dominant maneuver, precision engagement, focused logistics and full-dimensional protection. Information superiority will be obtained via offensive and defensive measures. Offensive Information Warfare (IW) will "degrade or exploit an adversary's collection or use of information" to range from electronic intrusion to destruction of C2 capability. Defensive IW will assure the protection of our systems from exploitation through traditional methods of physical security, encryption and emerging non-traditional methods of virus protection and anti-hacking.[15]

A complete and thorough understanding of the value of offensive and defensive IW will lead the commander to freedom of action, referred to as "Full Spectrum Dominance" in Joint Vision 2010 parlance. Members of the first Secretary of Defense Strategic Studies Group refined IW to be "Knowledge-Based Warfare" or KBW which when coupled with the proper application of operational art "provides superior situation awareness of the battlespace, allowing us to decide at a faster pace than an enemy."[16] This ability to operate unrestricted

within one's own decision cycle while hampering an adversary's ability is IW/KBW providing the operational commander the freedom to act.

IW is not without its perils however. Commanders must determine if sophisticated IW/KBW methods are appropriate and can even impact a situation when faced with "low-technology adversaries, fanatics or rogue nations that do not depend on free flowing information."[17] This is most likely the case in military missions derived from Military Operations Other Than War (MOOTW). The commander must fully grasp the intricacies of offensive and defensive IW as they relate to an adversary to insure one's own freedom of action is maintained or an adversary, regardless of sophistication, is denied the freedom to act.

Intelligence

> . . . by multiplying the means of obtaining information; for, no matter how imperfect and contradictory they may be, the truth may often be sifted from them.
>
> - Baron de Jomini, *The Art of War*

Intelligence is the "product resulting from the collection, processing, integration, analysis, evaluation and interpretation of available information concerning foreign countries or areas" and "information and knowledge about an adversary obtained through observation, investigation, analysis, or understanding."[18]

The importance of the complete availability of intelligence during the planning of an operation cannot be overemphasized and it is an integral element supporting all operational factors. An assessment of an adversary's intelligence

capability is equally important to a commander's decision process, for "advance knowledge . . . must be gained from men for it is the knowledge of the enemy's true situation."[19] To insure success in countering this intelligence threat, the commander's ability to develop adequate security measures is supported through "knowledge and understanding of enemy strategy, tactics, doctrine and staff planning."[20]

The Battle of Midway is a celebrated success of Navy intelligence to provide the right piece of information to the commander and is illustrative of how important it is to understand one's own capability as well as that of an adversary. If the Japanese had understood the U.S. capability to intercept and break Japanese codes, they may have changed codes and/or opted to employ deception with a feint toward Midway while striking more forcefully at the Aleutians.

The Media

> *Sir, a journalist has arrived, shall I arrest him?*[21]
> - Radio query to Royal Marine Colonel (Tanganyika, 1964)

Interaction of the military with the media is not a new phenomenon. However, with the global reach of the media "and in an age of instant communications , capabilities available to the media have had increasingly important impacts on military operations."[22]

Abraham Lincoln and Ulysses S. Grant certainly recognized the need for good press as the summer of 1864 wore on. If not for Sherman's success at Atlanta, the press may well have convinced the northern voter that Lincoln did not deserve

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reelection, that emancipation should be abandoned and that the war should be terminated. Public opinion was and continues to be shaped through media accounts of military successes and failure.

The Media has been supported by the military with varying degrees of success. Movements and accessibility of journalists to the military during both world wars was strictly controlled and many times subject to censorship. Winston Churchill and President Roosevelt were critical of the "interpretive and speculative commentary"[23] of the press during World War II and as such recognized the need to deal constructively with the media. The Falklands conflict is an example of poor military-media interaction which, though it did not lead to a loss of the war, it arguably did lead to loss of life and the chagrin of the commander, Admiral Sandy Woodward. The press "did not see itself on 'our' side at all" Woodward indicated, and his difficulty in dealing with them stemmed from their envisioning themselves as "a fearless seeker after truth." [24]

Vietnam was the coming of age of the relatively new medium of television and it's ability to impact public thinking by bringing images of the war into the American living room. It is arguably the first information war wherein the "inexperience of reporters, propaganda, sensationalism, news selection and the realities of war"[25] led to a belief that the "media lost the Vietnam War for the United States."[26]

Events such as Cable News Network (CNN) correspondents filming Tomahawk strikes on Baghdad, news crews on the beaches of Somalia or daily

reports of atrocities in Bosnia-Herzgovina will require a synergistic media and military interaction. The military commander must understand the so-called "CNN-affect" and deal decisively with the complex media-military relationship. Detailed planning must be conducted during all phases of an operation to account for the media's influence. To be successful, the commander must know how to properly interact with the media, balance security concerns with the public's right to know and fully appreciate the powerful role played by the media in influencing public policy, military actions and the will of the people. U.S. leadership during Desert Shield/Desert Storm certainly understood this complex relationship and used it to good advantage. General Schwarzkopf's four rules for dealing with the media are an excellent starting point for future commanders:

(1) Don't let them intimidate you, you know a hell of a lot more about what's going on than they do,
(2) There's no law that says you have to answer all their questions,
(3) Don't answer any question that in your judgement will help the enemy,
(4) Don't ever lie to the American people.[27]

Adversary Knowledge

Therefore a general who understands warfare is Master of Fate for the people, ruler of the state's security or endangerment.
                                                        - Sun Tzu, The Art of War

Adversary knowledge is easily the largest and most important of the five elements and can be considered the area in which "one who knows the enemy and knows himself will not be endangered."[28] Adversary knowledge ranges from a commander's "wisdom" and motivation in waging war to an historic representation of what type of warfare has been undertaken in the past. The

military commander must possess "an intellect which, even in the midst of this intense obscurity [i.e. war], is not without some traces of inner light, which leads to the . . . rapid discovery of . . . truth."[29]

The knowledge of one's own capabilities and those of an adversary are integral to the decision process and properly balancing time, space and forces is essential in planning military activities. As seen during the first years of the American Civil War, northern initiative was hampered by timid generals who failed to recognize and seize advantages. Understanding and exploiting the timidity of an adversary or their penchant for retreat, certainly mitigates against numerical superiority or the tactics employed. The greatest advantage the Confederacy had during the Civil War was the understanding and knowledge that Robert E. Lee had of his adversaries. The Union was never able to select a leader (not even Grant) which Lee did not understand. Lee was uncanny in his ability to know when, where and how to exploit his adversary's weaknesses.[30]

Desert Storm illustrates how failing to appreciate an adversary's situation can protract a conflict. The January border battles illustrated the weakness of the Iraqis' position and their vulnerability to air attack. After these attacks were suppressed with relative ease, General Schwarzkopf failed to understand the significance of what in fact had been a major Iraqi offensive and did not adjust the plan for the coming land offensive.[31] "He failed to 'read' his enemy and fell into the very trap he sought to avoid, that of being mechanical in his planning."[32]

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As B.H. Lidell Hart points out, "the exceptional professional soldier who has achieved mastery of his profession knows that there is no royal road to competence."[33] Achieving mastery, however, implies stagnation, therefore commanders must strive to continually evolve with their profession and must recognize the evolution of their potential adversaries. The danger facing future commanders is "that an enemy may bypass industrial age forces and leap straight into dramatically more effective information age capabilities."[34] It is therefore essential that the knowledge of one's adversary includes an assessment of the type of warfare to be employed. This is best illustrated by Napoleon's failure to recognize the advances made by the Austrians and Russians in their assimilation of Napoleon's own type of warfare. Napoleon's defeat at Aspern-Essling was due in large part because he "mistakenly believed that these were the same old Austrians that he had defeated throughout his career."[35] If his knowledge of his adversary had been better, he might not have blundered into the first battlefield defeat of his life.[36] Frontal assaults against entrenched positions were lessons learned during the Napoleonic campaigns at Bordodino and Torres Vedras but they were continually repeated during the American Civil War and World War I with the same disastrous results.[37]

The knowledge of an adversary, to the greatest extent possible, provides the operational commander with the ability to anticipate and mass appropriate force at the proper time and location. Additionally, in depth understanding leads to enhanced situation awareness and proper identification of centers of gravity,

strengths, weaknesses and vulnerabilities. Failing to understand an adversary, leads to uncertainty, friction and an increase in the "fog of war."

CONCLUSION

Information is certainly an operational factor. The factors of time, space and forces have not diminished in importance but will be properly complimented by the inclusion of information as a full partner.

The three factors of time, space and forces sufficiently address the when, where and with what questions confronting the commander. But as we transition from the Industrial Age thought process to Information Age cognition, the central question not adequately addressed by these three factors is how the commander should efficiently and effectively employ all available forces within the battlespace infosphere.

A commander, to be successful, must possess complete situation awareness and fully understand all the data on an adversary and one's own forces as they apply within the battlespace. This includes the media and the role it will play in all future conflicts. Most importantly, the commander must possess the warfighting intellect to properly employ forces and must have a thorough understanding of an adversary's ability to do the same. Without this clear perception of strategic, operational and tactical realities, the commander cannot properly act.

History is rife with lessons learned and relearned because information was poorly assimilated. Napoleon's defeats were brought about through the evolution

of his adversaries and his failure to recognize their transition. Disastrous frontal assaults against entrenchments were repeated in the Civil War and World War I even though the lesson had been "learned" during the Napoleonic campaigns. Vietnam was a tragic media influence misjudgment by the United States and the media/military interaction has yet to be fully solved. Grenada "success" was achieved through overkill in spite of C2 and Jointness blunders. Even Desert Storm showed a lack of appreciation for an adversary's condition when by commencement of the ground war, the Iraqi military was arguably all but defeated.

Traditional relative combat strength ratios and overwhelming force are no longer absolutes in the Information Age. Data provided by elements of the operational factor, information dealing with all levels of war and operations other than war provides warriors the knowledge, which when properly assimilated, supports the commander's freedom to act and may be the difference between success and failure.

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C4ISR is Command and Control, Computer, Communications and Intelligence, Surveillance and Reconnaissance.

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FACTOR INFORMATION

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INFORMATION INFRASTRUCTURE
- MATURE
- IMMATURE
- MILITARY
- COMMERICIAL

C²
- SPEED
- CAPACITY
- SURVIVABILITY
- SECURITY
- ACCURACY
- METHODS

MEDIA
- CAPACITY
- CONTROL
- INFLUENCE
- SECURITY vs RIGHT TO KNOW
- ATTITUDE
  - HOSTILE
  - UNBIASED
  - FRIENDLY

INFORMATION WARFARE
- OFFENSIVE
- DEFENSIVE
- CAPABILITY
- AVAILABILITY

INTELLIGENCE

ADVERSARY KNOWLEDGE
- TYPE OF WARFARE
- READINESS
- ABILITY TO MAINTAIN OFFENSIVE
- FORCE EMPLOYMENT
- WARFARE "WISDOM"
- HISTORIC EMPLOYMENT
  - OFFENSIVE
  - DEFENSIVE
  - RECKLESS
  - TIMID
  - REASONABLE
- LEADERSHIP
- MOTIVATION/ RESOLVE

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